

## Claims

1. Method for production of a semi-finished product made of zirconium alloy containing by weight at least 97% zirconium, intended for the production of flat products, in which a large ingot is produced by casting the zirconium alloy, then by forging the large ingot the semi-finished product intended to be hot rolled then cold rolled to obtain a flat product is produced, heat treatments of quenching and annealing being interspersed between at least certain of the forming operations, characterised in that the semi-finished product (8) is produced from the large cast ingot (1) by a single forging operation at a temperature at which the zirconium alloy is in a state comprising the crystalline  $\alpha$  and  $\beta$  phases of the zirconium alloy.
2. Method as claimed in claim 1, characterised in that at the forging temperature the ingot contains a volume proportion of zirconium alloy in the  $\alpha$  phase between 10% and 90%, the remainder of the zirconium alloy of the ingot being in the  $\beta$  phase.
3. Method as claimed in claim 1 or claim 2, characterised in that the semi-finished product is a slab (8).
4. Method as claimed in claim 3, characterised in that the slab (8) has a thickness of around 100 mm and is intended for the production of a flat product with a thickness between 0.2 mm and 4 mm.
5. Method as claimed in any of claims 1 to 4, characterised in that the forging of the zirconium alloy in the  $\alpha$  and  $\beta$  phase is performed at a temperature between 850°C and 950°C.
6. Method as claimed in any of claims 1 to 5, characterised in that the zirconium alloy contains at least 3% by weight in total of the additive elements comprising at least one of the elements tin, iron, chromium, nickel, oxygen, niobium, vanadium and silicon, the remainder of the alloy being constituted by

zirconium with the exception of the inevitable impurities.

7. Use of the method as claimed in any of claims 1 to 6 for production of a slab intended for the production of a flat product of a thickness between 0.2 mm and 4 mm for the manufacture of a nuclear fuel assembly such as a plate for a spacer grid for a fuel assembly for a PWR reactor or a wall of a housing of a fuel assembly for a BWR reactor or a fuel assembly element for a CANDU reactor.